

### AMENDMENTS TO THE CLAIMS

The listing below of the claims will replace all prior versions and listings of claims in the present application:

#### **Listing of Claims:**

Claim 1 (currently amended): A method of transmitting electric current to a furnace having a wall which is heated by electric current conducted ~~in~~ into the furnace wall, said method comprising the steps of:

providing a furnace having an electrically conductive furnace wall that is heated electrically;

providing a plurality of spaced, electrically conductive current input devices that are in contact with an outer surface of the furnace wall [[,]] and that have a main body portion; and

forming in at least one of the electrically conductive current input devices at a position in close proximity to the outer surface of the furnace wall a ~~section~~ region of the at least one current input device that has a smaller cross-sectional area than the ~~remaining part~~ main body portion of the at least one electrically conductive current input device, so that current flow toward the furnace wall through said smaller cross-sectional area region of the at least one electrically conductive current input device develops heat in the ~~region of said smaller cross sectional area of a magnitude that corresponds substantially with the magnitude of heat that would have been transmitted from the furnace wall to a respective electrically conductive device in the absence of said smaller cross sectional area~~ a higher temperature than in the main

body portion of the at least one electrically conductive current input device, to provide a local increase in heat flow from the at least one electrically conductive current input device to the furnace wall outer surface at the contact position of the at least one electrically conductive current input device with the furnace wall outer surface.

Claim 2 (currently amended): A method according to Claim 1, including the step steps of:

applying current to electrically conductive current input devices that lack a section of smaller cross-sectional area; and

dimensioning the electrically conductive current input devices that lack a smaller cross-sectional area so that heat ~~flow~~ developed therein corresponds ~~essentially to a heat flow magnitude that would have been transmitted from the furnace wall to the electrically conductive devices in the absence of said current in combination with the dimensioning of said conductive devices~~ substantially with the heat flow from the at least one electrically conductive current input device that includes the region of smaller cross-sectional area.

Claim 3 (previously presented): A method according to Claim 1, wherein the electrically conductive devices in contact with the furnace wall are selected from the group consisting of electric current input devices, electric current output devices, supports, measuring devices, and combinations thereof.

Claim 4 (previously presented): A method according to Claim 1, wherein surfaces of the electrically conductive devices in contact with the furnace wall have a cross-sectional shape selected from the group consisting of square, circular, and rectangular shape; and the cross-sectional areas of the electrically conductive devices have substantially the same size.

Claim 5 (currently amended): A method according to Claim 1, including the ~~steps of providing at least one electrically conductive device as an electric current input device; and~~ step of providing at least one electrically conductive current drainage device ~~as a current output device~~, wherein current flows through the furnace wall by delivering said current through the at least one current input device, and current passes from the furnace wall through the at least one current output drainage device.

Claim 6 (currently amended): A method according to Claim 1, including the step of providing in electrically conductive electrical current input devices placed in the proximity of a furnace wall volume where precision temperature control is desired waists that define smaller cross-sectional area regions of suitable dimensions for establishing ~~an energy balance between a thermal flow from a~~ a desired heat flow toward the furnace wall ~~and a thermal flow induced by current provided to the current input devices~~ volume where precision temperature control is desired.

Claim 7 (previously presented): A method according to claim 1, including the step of producing the furnace as a tube-like furnace from FeCrAl.

Claim 8 (currently amended): An arrangement for transmitting electric current to a furnace having a wall which is heated by electric current conducted ~~in a~~ into the furnace wall, said arrangement comprising:

a furnace having an electrically conductive furnace wall that is heated electrically;

a plurality of spaced electrically conductive devices located in abutment with an outer surface of the furnace wall and having a main body portion, wherein at least one of the electrically conductive devices is an electrically conductive current input device and has close to said furnace wall a ~~section~~ region which has a smaller cross-sectional area than the ~~remaining part~~ main body portion of the at least one electrically conductive current input device, so that electrical current passing through this the smaller cross-sectional area ~~generates heat in a magnitude that corresponds substantially with the magnitude of heat that would otherwise have been conducted from the furnace wall to the electrically conductive device in the absence of said smaller cross-sectional area~~ region develops a higher temperature than in the main body portion of the at least one electrically conductive current input device, to provide a local increase in heat flow from the at least one electrically conductive current input device to the furnace wall outer surface at the contact position of the at least one electrically conductive current input device with the furnace wall outer surface.

Claim 9 (currently amended): An arrangement according to Claim 8, wherein electrically conductive current input devices that lack a section of smaller cross-sectional area carry current; and dimensioning the electrically conductive current input devices that lack a smaller cross-sectional area so that heat flow ~~been transmitted from the furnace wall to the electrically conductive devices in the absence of said current in combination with the dimensioning of said electrically conductive devices~~ developed therein corresponds substantially with the heat flow from the at least one electrically conductive current input device that includes the region of smaller cross-sectional area.

Claim 10 (previously presented): An arrangement according to Claim 8, wherein the electrically conductive devices in abutment with the furnace wall are selected from the group consisting of current input devices, current output devices, supports, measuring devices, and combinations thereof.

Claim 11 (previously presented): An arrangement according to Claim 8, wherein areas of cross-sectional surfaces of the electrically conductive devices in contact with the furnace wall have shapes selected from the group consisting of square, circular, and rectangular shapes; and said cross-sectional surfaces have substantially the same sizes.

Claim 12 (currently amended): An arrangement according to Claim 8, wherein ~~at least one of the electrically conductive devices is a current input device;~~

and at least one of the electrically conductive devices is a current ~~output~~ drainage device, and wherein current flows through the furnace wall from current input devices to current ~~output~~ drainage devices.

Claim 13 (currently amended): An arrangement according to Claim 8, wherein electrically conductive current input devices placed in proximity to a furnace wall volume where precision temperature control is desired are provided with waists that define smaller cross-sectional area regions of suitable dimensions for establishing ~~an energy balance between thermal flow from~~ a desired heat flow toward the furnace wall ~~and thermal flow induced by current flowing through a current input device~~ volume where precision temperature control is desired.

Claim 14 (previously presented): An arrangement according to claim 8, wherein the furnace is a tubular furnace and is made of FeCrAl.